APPLICATION DEVICES

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CROSS REFERENCE

This application claims priority under Title 35, United States Code 119(e) from Provisional Application Serial No. 60/255,045, filed December 12, 2000.

TECHNICAL FIELD

The present invention relates to an application device for applying an adhesive patch.

BACKGROUND

While many application devices for adhesive patches have been described, various problems are associated with their use. See, for example, U.S. Pat. Nos. 4,913,138; 5,106,629; 5,397,297; 5,511,689; 5,656,282; 5,685,833; 5,891,078; 6,129,929; and international publication number WO 98/17216. Use of many of these devices, for example in the application of an adhesive patch, results in the patch curling or adhering to itself before it can be secured to the target surface. Another problem with many application devices is that the user is forced to touch the surface of the patch during application. This is particularly problematic when the patch is intended to be sterile or contains an adhesive surface. Such contact either contaminates the patch or reduces the adhesiveness of the patch.

There are one-handed patch application devices in the art that reportedly minimize the occurrence of a user having to touch the surface of the patch. However, many of these devices have a tab on the applicating member that overlaps the releasing member. Such a design makes it difficult for the user to grasp the tab and pull the applicating member away from the releasing member. Still other one-handed patch application devices require the user to grasp the applicating member in one location, to release the applicating member from the releasing member, and then to grasp the applicating member in another location to apply the patch to the target surface. Still other devices have adhesive disposed throughout the applicating member, thereby diffusing actives, dyes, etc., from the patch into the

adhesive and diminishing the effectiveness of the patch. Still other devices have a limited number of adhesives that can be utilized and function as a one-handed device. Still other devices pose narrow manufacturing tolerance ranges during assembly.

For the foregoing reasons, there is a continuing need for a patch application device that: applies a patch to a target surface without the patch curling upon itself; without the patch unnecessarily being touched by the user; that allows a user to easily remove the releasing member from the applicating member containing the patch, in turn, applying the patch to a target surface and thereby removing the applicating member with the patch affixed to the target surface; without the user releasing the applicating member as originally grasped; with minimal diffusion of an active of the patch diffusing into the adhesive disposed on the applicating member; with diverse number of operable adhesives and materials; and with increased manufacturing tolerances.

SUMMARY OF THE INVENTION

The present invention provides an application device that comprises an applicator substrate, a release substrate, and a patch interposed therebetween suitable to apply to a target surface. The applicator substrate is substantially planar and has an outwardly extending graspable tab. The applicator substrate has an interior surface that has an adhesive means that comprises an adhesive area. The patch is substantially planar and has a first and second surface. The adhesive area of the applicator substrate releasably affixes the first surface of the patch thereby comprising a first peel bond and thereby forming an applicator substrate / patch combination (hereinafter "combination"). The combination has an upper surface. The second surface of the patch comprises an adhesive means. The release substrate is substantially planar, has an outwardly extending graspable tab, and has an interior surface. The interior surface of the release substrate is releasably affixed to the upper surface of the combination thereby comprising a second peel bond. Further, the tab of the releasably affixed release substrate is offset laterally from the combination. The strength of the first peel bond is greater than the strength of the second peel bond thus enabling the user to separate the release substrate from the combination. Upon removing the release substrate and applying the upper surface of the combination to a target surface, an adhesive bond is formed between the second surface of the patch and the target surface.

The strength of the adhesive bond is greater than the strength of the first peel bond thereby enabling the applicator substrate to be removed from the patch after applying the patch to the target surface.

BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out and distinctly claiming the invention, it is believed that the present invention will be better understood from the following description taken in conjunction with the accompanying drawings in which:

Fig. 1 is an exploded view of a first embodiment of the application device made in accordance with the present invention;

Fig. 2 is a top plan view of the of the first embodiment of the invention prior to removal of the release substrate;

Fig. 3 is a top plan view of a second embodiment of the invention after removal of the release substrate;

Fig. 4 is a schematic illustration of a process suitable for manufacturing the first embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

Reference will now be made in detail to embodiments of the invention, examples of which are illustrated in the accompanying drawings wherein like numerals indicate the same elements throughout the views and wherein elements having the same two last digits (e.g., 20 and 120) or an alphabetic suffix (e.g., 22A and 22B) connote similar elements.

FIGS. 1 and 2 illustrate a first embodiment of the invention. FIG. 1 is an exploded view while FIG. 2 is a top plan view. A laminar application device **20** of the present invention comprises a substantially planar applicator substrate **32**, an interposed substantially planar patch **44**, and a substantially planar release substrate **24**. The applicator substrate **32** comprises a graspable tab **36** extending outwardly therefrom. The applicator substrate **32** also comprises an interior surface **48**. The interior surface **48** of the applicator substrate **32** comprises an adhesive means that is bonded, coated, formed, laminated, or otherwise applied to the interior surface **48** of the applicator substrate **32** to

comprise an adhesive area **40**. The adhesive area **40** shown in FIGS. 1 and 2 extends about 40% of the interior surface **48** but does not extend to the tab **36** of the applicator substrate **32**. Preferably the adhesive area extends about 1% to about 95%, more preferably about 20% to about 60%.

Still referring to FIGS. 1 and 2, the device **20** further comprises a substantially planar patch **44** interposed between the applicator substrate **32** and release substrate **24**. The patch **44** comprises a first surface **56** and a second surface **60**. The adhesive area **40** partially underlies and releasably adheres the patch **44** to the interior surface **36** of the applicator substrate **32**. The adhesive area **40** also releasably adheres the release substrate **24**. The first surface **56** of the patch **44** is releasably affixed to the interior surface **48** of the applicator substrate **32** by the adhesive means (having an adhesive area **40**), thereby comprising a first peel bond, and thereby forming an applicator substrate/patch combination **95** (hereinafter "combination"). As used herein, "peel bond" means a bond formed between two surfaces adhered to each other as measured by a bond force. As used herein, "bond force," means the amount of force necessary to separate the two surfaces from each other thereby measuring the strength of the bond. Thus, if the strength of a first peel bond is greater than the strength of a second peel bond, a greater bond force is necessary to separate the surfaces comprising the first bond as compared to the surfaces comprising the second peel bond.

As shown in FIG. 2, the adhesive area **40** that adheres the first surface **56** of the patch **44** comprises an adhesive contact area having a leading edge contact area **41** and trailing edge contact area **42**. Preferably the releasably affixed patch **44** does not overlap the tab **36** of the applicator substrate **32**. The combination **95** comprises an upper surface (not shown).

As shown in FIG. 1, the second surface **60** of the patch **44** comprises an adhesive means (not shown) that is also bonded, coated, formed, laminated, or otherwise applied to the second surface **60** of the patch **44**. The adhesive means of the second surface **60** of the patch **44** is preferably continuous with the second surface **60** of the patch **44**. The adhesive means of the second surface **60** of the patch **44** is exposed on the upper surface of the combination **95**. Although not shown in FIG. 1, when a user applies the upper surface of the combination **95** to a target surface, the adhesive means of the second

surface **60** of the patch **44** affixes the patch **44** to the target surface thereby comprising an adhesive bond. The strength of an adhesive bond is measured by a bond force.

Referring to FIGS. 1 and 2, the device **20** includes a release substrate **24** comprising a graspable tab **28** extending outwardly therefrom. The release substrate **24** comprises an interior surface **68** that is releasably affixed to the upper surface of the combination **95** thereby comprising a second peel bond. The adhesive means of the second surface **60** the patch **44**, or the adhesive means of the interior surface **48** of the applicator substrate **32**, or a combination thereof, releasably adheres the release substrate **24** to the combination **95**. Preferably when the release substrate **24** is releasably affixed to the combination **95**, the interposed patch **44** is enclosed between the applicator substrate **32** and the release substrate **24** thereby comprising a closed container for the patch **44**.

Referring to FIGS. 1 and 2, when assembled as a device **20**, the outwardly extending tab **28** of the release substrate **24** is offset laterally from the combination **95** to allow for easy grasping by the user. As used herein, "offset laterally" means the tab **28** of the releasably affixed release substrate **24** is at least partially offset laterally from the combination **95** that includes the tab **36** of the applicator substrate **32**. In one embodiment, the tab **28** of the release substrate **24** is completely offset laterally from the combination **95**. As shown, the graspable tabs **36**, **28** of the release substrate **24** and the applicator substrate **32** are laterally offset from each other and are not bonded together. The respective tabs **36**, **28** are arranged such that the user can grasp the respective tabs **36**, **28** simultaneously without having to digitally separate them. As shown, both tabs **36**, **28** are free for grasping.

To facilitate the use of the device **20**, the tabs **36**, **28** of the applicator substrate **32** and the release substrate **24** may be identified and distinguished by a variety of means including color, printing, labeling, varying tab shape/size, transparity/opaqueness of the materials, or any combination thereof. The device **20** may be accompanied by instructions detailing how the device **20** is to be applied.

Applicants discovered that a significant factor in determining the strength of the first peel bond is the pattern of the adhesive area **40**, more specifically the adhesive contact area. Referring to FIGS. 1 and 2, the adhesive contact area has a leading edge

contact area **41** and a trailing edge contact area **42**. The patch **44**, when releasably affixed to the applicator substrate **32** thereby forming the combination **95**, comprises a circumferential lateral edge **45**. As used herein, the "circumferential lateral edge" means the lateral edge of the outer most surrounding boundary of the patch **44**. The circumferential lateral edge **45** has a leading edge **46**, a trailing edge **47**, and a non-securing edge **48**. The leading edge **46** is proximate to the tab of the release substrate **28** when the release substrate **24** is releasably affixed to the combination **95**. The tab **28** of the release substrate **24** dictates the peel direction of the release substrate **24** as the user removes the release substrate **24** from the combination **95**. As used herein, "peel direction" means the course taken by one laminate as it is peeled from another laminate. The leading edge **46** of the patch **44** of the combination **95** is the first exposed surface of the patch **44** as the user removes the release substrate **24** from the combination **95**. The trailing edge **47** is distal to the tab **28** of the release substrate **24**. As the user continues to remove the release substrate **24** from the combination **95**, the trailing edge **47** is the last exposed surface of the patch **44**.

The leading edge contact area **41** tacks the leading edge of the patch **46** to the interior surface **48** of the applicator substrate **32** when the release substrate **24** is removed from the combination **95**. Thus, the leading edge of the patch **46** is the part of the circumferential edge **45** of the patch **44** that is tacked by the adhesive contact area, and that is first exposed as a user removes the release substrate **24** from the combination. The leading edge **46** need not be continuous with the leading edge contact area **41** (as shown in the first embodiment of the present invention). Preferably the leading edge **46** comprises about 1% to about 45%, more perferably about 10% to about 30% of the total circumferential lateral edge **45** of the patch **44**.

Similarly, the trailing edge contact area **42** tacks the trailing edge **47** to the interior surface **48** of the applicator substrate **32** when the release substrate **24** is removed from the combination **95**. The leading edge **47** need not be continuous with the trailing edge contact area **42** (as shown in the first embodiment of the present invention). Preferably the trailing edge **47** comprises preferably about 1% to about 50%, more preferably about 10% to about 35% of the total circumferential lateral edge **45** of the patch **44**. In the first embodiment of the invention, the leading edge **46** of the patch is diagonal to the trailing

edge **47** of the patch. Similarly, in the first embodiment of the invention, the leading edge contact area **41** is diagonal to the trailing edge contact area **42**.

The non-securing edge **48** is the part of the circumferential lateral edge **45** of the patch **44** that is not tacked by the adhesive contact area. Preferably the non-securing edge comprises about 5% to about 95%, more preferably about 40% to about 80%, of the total circumferential lateral edge **45** of the patch **44**.

By tacking the leading edge **46** and the trailing edge **47**, the adhesive contact area facilitates a patch **44** being applied to a target surface without the patch **44** curling upon itself and without the user unnecessarily touching the patch **44**. Preferably the leading edge contact area **46** comprises an area of . 1 cm^2 to 4000 cm^2, more preferably .4 cm^2 to 2 cm^2. Preferably the trailing edge contact area **42** comprises an area of 1 cm^2 to 4500 cm^2, more preferably .4 cm^2 to 2.5 cm^2.

FIG. 3 is a top plan view of the combination **195** of a second embodiment of the invention after removal of the release substrate (not shown in FIG. 3). The combination **195** comprises a patch **144** releasably affixed to an applicator substrate **132**, wherein the applicator substrate **132** comprises a graspable tab **136** extending outwardly therefrom. The applicator substrate **132** comprises an adhesive means that is bonded to the applicator substrate to comprise an adhesive area **140**. The patch is releasably affixed to the adhesive area **140** of the applicator substrate **132**. The adhesive area **140** that adheres the patch **144** comprises an adhesive contact area that has a leading edge contact area **141** and a trailing edge contact area **142** that are each of a curvilinear "scallop-shaped" pattern. The patch **144**, in turn, comprises a circumferential lateral edge **145** having a leading edge **146**, a trailing edge **147**, and a non-securing edge **148**. Although not shown in FIG 3, the leading edge **146** is proximate the tab of the release substrate when the release substrate is releasably affixed to the combination **195**.

Referring to FIG. 1, the strength of the first peel bond is greater than the strength of the second peel bond such that when the user removes the release substrate **24** from the combination **95**, the patch **44** remains releasably affixed to the applicator substrate **32**. Further, the strength of the adhesive bond is greater than the strength of the first peel bond such that when the user applies the upper surface of the combination **95** to the target surface, the patch **44** affixes to the target surface and releases from the combination **95**.

To this end, the present invention provides increased bond strength ratios between the three bonds thereby enhancing the performance of the device; providing a greater range of operable adhesive types; providing a greater range of operable patch sizes; providing greater tolerance to design modifications; and requiring less overall adhesive to be utilized. In turn, utilizing less adhesive provides for savings in manufacturing costs, diminishing the amount of active that is able to diffuse from the patch **44** to the adhesive of the interior surface **48** of the applicator substrate **32**, and diminishing the amount of Pextractables from the adhesive of the interior surface **48** to the patch **44**..

Referring to FIGS. 1 and 2, Applicants also discovered that if the leading edge contact area **41** and the trailing edge contact area **42** are patterned in a sinusoidal manner as illustrated by the first embodiment of the invention, greater tolerance for manufacturing variations are exhibited. As used herein, "manufacturing variations" means those variations that occur during the many steps of mass producing the device of the present invention such as, but not limited to: the placement of the patch **44** onto the adhesive area **40**. For example, with many adhesive area **40** patterns, the patch **44** must be applied precisely to adhesive area **40** during manufacturing. By patterning the leading edge contact area **41** and trailing edge contact area **42** in a sinusoidal manner, Applicants observed that the patch **44** can be applied to the applicator substrate **32** during manufacturing with increased tolerances. For example, Applicants observed an embodiment of the device that represented a patch placement area of 122% as compared to the area of the patch. More specifically, in the embodiment so described, the interior surface of the applicator substrate, not including the area of the tab, is 32.5 cm^2, the first surface of the patch is 18 cm^2 area, and a patch placement area 22 cm^2.

Referring to FIG. 2, the sinusoidal pattern of the adhesive contact area may have a number of curves. Furthermore, these curves need not be symmetrical with one another.

Still referring to FIG. 2, Applicants observed that theoretical peel force (Newtons) of the first peel bond can be predicted by multiplying the maximum contact width (cm) by an adhesive's art-accepted adhesive peel force coefficient (Newtons / cm). As used herein, "maximum contact width" means the greatest linear dimension perpendicular to the peel direction within the leading edge contact area **41** or trailing edge contact area **42**.

Actual peel force can be measured by a compression/tensile tester (Instron), or a Friction/Peel Tester (Thwing Albert).

FIG. 4 is a schematic illustration for a process suitable for manufacturing the application devices herein. The transformation flow chart generally represents two paths that converge and combine to form the final application device product. The manufacturer first combines overlapping webs of a release substrate web and a patch web into a stock roll (without limitation, the manufacturer is Watson Laboratories, Inc., Salt Lake City, UT). The manufacturer also first combines overlapping webs of an applicator substrate web, an adhesive web that has been cut in the desired pattern, and an adhesive web release liner into a stock roll (without limitation, the manufacturer is Marion, Inc., Indianapolis, IN). The first path of the transformation flow chart begins with the unwinding of stock release substrate web and patch web **74**. The unwinding process consists of converting these stock materials that are in rolls, into continuous flat sheets. The second path of the transformation flow chart begins with the unwinding of stock applicator substrate web, adhesive web, and adhesive web release liner **76.** As with the first path, the unwinding process of the second path consists of converting these stock materials that are in rolls, into continuous flat sheets while the adhesive web release liner is removed and rewound **82**. Returning to the first path, the combined release substrate web and patch web are "kiss cut" **78**, i.e. cutting the patch film without cutting the release liner web. Concomitantly, scrap patch film is stripped off for rewinding **80**. In the next steps of both the first and second pathways, the tabs of the respective release substrate web and application substrate web are die cut to slit the tab portions of the respective webs **84**, **86** without removing or dislodging any material. The first and second pathways converge in a combining step **88** wherein the applicator substrate web and release substrate web are combined in a registered fashion. The subsequent die cutting–final step **90** die cuts the combined webs to the desired finished shape and appropriately spaces the finished application devices as they move along on a conveyor. The final die cutting step also removes scrap material. To this end, a final rewinding step **92** rewinds this scrap material. As to the final application devices, a take-away system **94** accepts incoming individual application devices off of the conveyor and places them in a collection unit

where finished product is packaged **96**. An optional packaging step is not shown, but can be included according to the desires of the manufacturer.

The device of the present invention minimizes user confusion and facilitates ease of use. Many other devices require the user to grasp the applicating member in one location to release the applicating member from the releasing member, and then to grasp the applicating member in another location to apply the patch to the target surface. In contrast, and referring to FIGS. 1 and 2, a user of the present invention grasps the tab **36** of the applicator substrate **32** and retains her grasp on the tab **36** during the entire process of using the device **20** to deliver a patch **44** to a target surface. In an embodiment, the user retains the grips on both the tab **36** of the applicator substrate **32** and the tab **28** of the release substrate **24** during the entire process of the using the device **20** to deliver the patch **44** to the target surface. In another embodiment, the user retains the grasp on the tab **36** of the applicator substrate **32** during the entire process of the using the device **20** and presses on the exterior side of the combination (not shown) with the other hand after applying the combination **95** to the target surface and before removing the applicator substrate **32**, thereby affixing the patch **44** to the target surface.

Other factors that affect bond strength, and hence bond force, include, but are not limited to: amount and type of adhesive, type of materials used and flexibility thereof, the size and thickness of each laminate, and the amount of force used to combine the laminates when constructing the device.

Suitable adhesives for use as either of the adhesive means are intended in the broadest sense. Non limiting examples of adhesives include: hook and loop closures, resin adhesives, latex; hotmelts, thermoplastic adhesives, acrylics, vinyl acetates, natural and synthetic rubbers, natural and synthetic gums, polysiloxanes, polyacrylates, ethylene/vinyl acetate copolymers, polyvinylpyrrolidones, vinylpyrrolidone copolymers and particularly vinyl pyrrolidone/vinylacetates, styrene block copolymers, natural or synthetic polysaccharides, cellulose materials, and mixtures therefrom.

In one embodiment, the adhesive means is a low tactile adhesive that is bonded to the first surface of the applicator substrate so that when the patch is removed from the applicator substrate, substantially all the first adhesive means remains on the applicator

substrate. Non limiting examples of low tactile adhesives include National Starch Acrylic adhesive #9296.

In another embodiment, the adhesive means is a double-sided high tack/low tack adhesive tape wherein the high tack side is bonded to the interior surface of the applicator substrate. Non limiting examples of high tack/low tack adhesives include those from 3M sold under the product description "9415" and "9416." In yet another embodiment, the adhesive means is a double-sided high tack/medium tack adhesive tape wherein the high tack side is bonded to the interior surface of the applicator substrate. A non limiting example of a double-sided high tack/medium tack adhesive tape includes one available from 3M under the product description "9425." In still yet another embodiment, the adhesive means is a low tactile acrylic adhesive that is bonded the second surface of the patch.

Suitable materials for use as the applicator substrate, patch, and release substrate are intended in their broadest sense. Non limiting examples include polyethylene, polyester, polypropylene, polyurethane, polyolefin, polyvinyl alcohol, polyvinyl chloride, polyvinylidene, polyamide, vinyl acetate resins, ethylene/vinyl acetate copolymers, ethylene/ethylacrylate copolymers, metal-vapor deposited films or sheets thereof, rubber sheets or films, expanded synthetic resin sheets or films, non-woven fabrics, fabrics, knitted fabrics, foils and papers. These materials can be used singularly or in combination, as laminates or as coextrusions, to form the applicator substrate, patch, and release substrate. The release liner may also be coated with a coating material such as silicone, TEFLON™, or thermoplastic materials such as polyester, polyvinyl resin, polyethylene or cellulose acetate, by any conventional means. By example only, different materials, production methods, and specifications are described in Hanlon, Joseph F., *Handbook of Package Engineering*, Technomic Publishing Co. (1992), incorporated herein by reference.

In one embodiment, the applicator substrate is polyester film. In another embodiment the patch is polyethylene film. In yet another embodiment, the release substrate is siliconized polyester.

Flexibility affects a peel bond. The type of material and the thickness thereof, in turn, determines flexibility. Preferably the applicator substrate has a thickness of .002cm

to .1cm, more preferably .005cm to .02cm. Preferably the patch has a thickness of .002cm to .05cm, more preferably .005cm to .013cm. Preferably the release substrate has a thickness of .002cm to .1cm, more preferably .005cm to .013cm. In one embodiment, the Release Substrate is more flexible than Application Substrate. Flexibility can be measured by a compression/tensile tester (Instron).

The size of each laminate of the device may vary. Preferably the applicator substrate has an area of $1cm^2$ to $5000cm^2$, more preferably $25cm^2$ to $40cm^2$. Preferably the adhesive area has an area of $.5cm^2$ to $4800cm^2$, more preferably $5cm^2$ to $20cm^2$. Preferably the patch has an area of .5 cm^2 to $4800cm^2$, more preferably $5cm^2$ to $28cm^2$. Preferably the release substrate has an area of $1cm^2$ to $5000cm^2$, more preferably $25cm^2$ to $40cm^2$.

The amount of force used to combine the laminates when constructing the present device **20** affects peel force. Preferably the combining force is from about 1 KPa to 175 KPa, more preferably about 5 KPa to about 40 KPa.

The patch of present invention can be applied to a target surface for many purposes. For example, a patch comprising latex may be applied to a puncture to fix a flat tire. The patch would seal the puncture and prevent air from escaping. A sterile patch comprising gauze may be applied to a skin wound to stop bleeding or to promote healing. A patch containing graphics could be applied to a surface to apply a sticker. A 1 or 2 sided tape could be applied to a surface using the application substrate. A large area patch containing graphics, printing or clear could be applied like "shelf paper" using the application substrate. A patch comprising peroxide may be applied to teeth as a whitening strip. Some other examples include applying a patch to a target surface that is in need for reinforcement, protection from abrasions, protective padding, or cushioned absorbent.

In another example, the patch is applied to the skin for cosmetic or medicinal purposes. In such an example, the patch comprises a releasable cosmetic or medicinal ingredient. Such ingredients, hereinafter referenced to as "actives," can be water-soluble, oil-soluble, or soluble in both water and in oil. Included among such ingredients are antimicrobials, rubifacients, analgesics, hormones, anti-seborrhea agents, anti-psoriatic agents, keratolytic agents, and the like. Such actives can be selected from a wide variety

of such materials that are known to be useful when affixed topically. Reference can be made to the *United States Pharmacopeia* for lists of such actives. A safe and effective amount of active is contemplated. A "safe and effective amount" of active is an amount that is effective as a cosmetic or medicinal ingredient without undue adverse side effects (such as toxicity, irritation, or allergic response), commensurate with a reasonable benefit/risk ratio when used in the manner of this invention.

When the patch is intended to deliver an active such as a drug, the patch may also contain agents known to accelerate the delivery of a drug through the skin or mucosa. These agents have been referred to as skin-penetration enhancers, accelerants, adjuvants, and sorption promoters, and are herein referred to collectively as "enhancers."

In addition to enhancers, there may also be incorporated various pharmaceutically acceptable additives and excipients available to those skilled in the art. These additives include tackifying agents such as aliphatic and aromatic hydrocarbons; binders such a lecithin; rheological agents such as fumed silica; as well as diluents, stabilizers, filler, clays, buffering agents, biocides, humectants, antiirritants, antioxidants, preservatives, colorants, and the like.

EXAMPLE 1

An application device of the present invention, as illustrated in FIGS. 1 and 2, is made by combing the laminates as follow:

Firstly, an applicator substrate is die cut from a sheet of polyester film purchased from Marion, Inc., under the product description "Type-D Mylar" of a thickness of 0.127 mm. The applicator substrate has an overall width of 6cm and a length of 6.5cm (including the tab) and has an overall area of $33cm^2$ wherein the tab has an area of $3cm^2$.

Secondly, the adhesive means of the interior surface of the applicator substrate is a double-sided tape high tack/low tack adhesive purchased from 3M Converter Markets, under the product description of "9596" with the high tack side bonded to the interior surface of the applicator substrate. The adhesive area is subsequently kiss-cut such that the leading contact area and the trailing edge contact area are of a sinusoidal pattern as illustrated in FIG. 2. The adhesive area is $13cm^2$. The leading edge contact area is $.7cm^2$ and the trailing edge contact area is $.8cm^2$.

Thirdly, the patch is die cut from a sheet of polyethylene film purchased from 3M under the product description "#9720" of 0.008cm thickness. However, before being die cut, the adhesive means of the second surface of the patch is coated on to the sheet. The adhesive means is an acrylic adhesive purchased from National Starch and Adhesives under the product description "Dura-Tak 87-2888" such that the adhesive is continuous with the sheet. The patch is die cut from the sheet with the coated acrylic adhesive such that the patch is an oval shape with a width of 3.5cm and a length of 5cm with an overall area of 14cm^2. The patch is placed upon the adhesive area such that leading edge is 20%, the trailing edge is 21%, and the non-securing edge is 59% of the circumferential lateral edge.

Lastly, a release substrate is die cut from a sheet of siliconized polyester purchased from Loparex under the product description as "3mil CL PET EXP 1000 EXP=X6AA12HZ." of a thickness of 0.008cm. The release substrate has an overall width of 6cm and a length of 6.5cm (including the tab) and has an overall area of 33cm^2 wherein the tab has an area of 3cm^2.

The laminates of the device are combined with a force of 7 KPa at a manufacturing speed of 120 patches/min.

The peel force of the first peel bond is .056N; the peel force of the second peel bond is 0.007N; and the peel force of the adhesive bond is .088N.

The patch of the foregoing type can be used to deliver hormones as part of a hormone therapy to a human female patient in need thereof.

EXAMPLE 2

A kit for applying a hormone patch according to the present invention is packaged in a singe-source container, as follows:

Kit

An application device according to Example 1.

A safe and effective amount comprising 14.2 mg coated of testosterone is coated onto the patch per conventional means.

Instructions for use.

A user in need of a hormone patch, per the instructions of the kit, applies the patch

comprising testosterone utilizing the application device.

While particular embodiments of the present invention have been illustrated and described, it will be clear to those skilled in the art that various changes and modifications may be made without departing from the spirit and scope of the invention, and it is intended to cover in the appended claims all such modifications that are within the scope of the invention.